

# PATENT SPECIFICATION

DRAWINGS ATTACHED

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## COMPLETE SPECIFICATION

### A method of Spraying Flat Sheet-like Material and Apparatus for Performing the same

We, TROCKENTECHNIK G.M.B.H., of Feldstrasse 51, Homburg/Niederrhein, Germany, a German Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a method of spraying flat sheet-like material, especially material with an irregularly contoured edge such as pieces of leather, and to apparatus for carrying out the method.

One known method of spraying flat sheet-like material conveyed in continuous motion on horizontal conveyor means is from spray guns which are moved to and fro across the direction of travel of the material, the to and fro movement of the sprayers being either along a linear or an arcuate path. Another known method of moving the spray guns is to fit a spray gun to the end of each arm of a four-armed spider and to rotate the spider about a vertical fulcrum. In this form of construction the spray guns travel beyond the edge of the sprayed material or beyond the edge of the travelling belt which conveys the sprayed material. The direction of motion of the spray guns thus reverses outside the perimeter of the sprayed material or outside the surface of the conveyor. During this period of reversal spraying is stopped, the dye admission valve or the air admission valve on the relative spray gun being closed. This action is controlled by a cam disc which actuates a mechanically operable valve or by switch means which actuate a solenoid-operable valve. The position of the cams on the cam disc is adjustable to permit the stopping and starting of the spraying action by the gun to be adjusted to the width of the article that is to be sprayed. The purpose of adjusting the width of the sprayed area is to economise in the expenditure of spraying medium. For spraying articles of uniform or substantially uniform width the de-

scribed devices are adequate. However, when spraying articles of irregular size, such as animal skins, the apparatus must be adjusted to cover the width of the largest skin, so that in the case of those skins which have a width less than this maximum considerable quantities of dye will still go to waste.

The present invention overcomes this disadvantage by means of a method for controlling the spraying of flat-sheet like materials to be sprayed, such as leather, sheets of metal, or the like, which are moved on horizontally moving conveyor means and with spray-guns so controlled by means of photo-electric cells that the spray-guns, which move along a circular path, are controlled by means of photo-electric cells which move along this same path. This has the advantage that from time to time only as much sprayed material is used, as corresponds to the width of the particular material to be sprayed. Since a certain period of time will elapse between the instant the sprayed medium leaves the gun and the instant it reaches the surface, the photocells are arranged to precede the spray guns in the direction of travel of the guns and to move at the same speed as the spray guns.

The apparatus for performing the invention comprises a revolving spider or ring to which the spray guns and the associated photo-electric cells are both attached. To allow for the delay between the instant the photo-electric cells generate a pulse and the instant the sprayed medium impinges upon the surfaces in the plane of the belt as well as for the deflection of the sprayed jet due to the rotary motion the photo-electric cells are adjustably mounted on the ring in relation to the spray guns at the end of the arms of the spider in such manner that they precede the spray guns in the direction of revolution. A light source may be associated with the photo-electric cells on the ring for illuminating the sprayed material in such manner that the reflected light will pro-

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duce the pulse in the photo-electric cells. In an alternative form of construction a second rotatable ring may be associated with the first-mentioned ring which carries the spray guns and the photo-electric cells, said second ring being equipped with mirrors or light sources, and the travelling material being moved between the two rings in spaced relationship thereto. The two rings rotate synchronously and the mirrors or light sources affixed to the second rotary ring are fitted in positions corresponding with the positions of the photo-electric cells on the first ring.

Illustrative forms of construction of apparatus for performing the invention are shown in the accompanying drawings in which

Fig. 1 is a diagrammatic view of apparatus according to the invention comprising a rotating ring which carries four spray guns and four associated photo-electric cells, and

Fig. 2 is a similar type of apparatus excepting that a second ring is associated with the first rotating ring.

The sprayed article 2, in the illustrated example a piece of leather, is conveyed in the direction of the arrow on a conveyor belt 1. Arranged above the conveyor belt is a spider 4 adapted to revolve about a pivot 3, the ends of the arms of the spider being connected by a ring 5. Preferably equidistantly disposed on the ring are spray guns 6. The supply of spraying medium and the admission of the required compressed air to the spray guns is effected in a manner already well known and not shown in the drawing. The spider 4 with its ring 5 revolves about the pivot 3 in the direction indicated by the arrow. Preceding the spray guns 6 in the direction of rotation photo-electric cells 7 are adjustably secured to the ring. In the illustrated example according to Fig. 1 the photocells are equipped with a light source which is not shown in the drawing. The light illuminates the sprayed article 2 and is reflected thereby to the relative photo-electric cell. Conveniently the conveyor belt 1 consists of a wire mesh or net material to provide a satisfactory amount of contrast between the belt and the sprayed article. It will be readily understood that instead of associating a separate light source with each of the photo-electric cells a single brighter source of light might be provided above the entire apparatus, which would then produce the same effect on the photo-electric cells as the several individual lights. When the spider 4 and the ring 5 are rotated the light reflected by the sprayed article enters the photo-electric cells whenever these are situated above the article. The pulse which starts up the relative spray gun is thereby produced. As soon as the photo-electric cells move outside the area above the sprayed article they cease to be illuminated by the reflected light and thus cause the relative spray gun to stop spraying.

To ensure that the photo-electric cells oper-

ate as required a cleaning device 8, consisting for instance of a rotating brush, is arranged to project into the photo-electric cell path. This brush serves to remove any particles of mist that may settle on the photo-electric cells during the process of spraying.

In the embodiment illustrated in Fig. 2 a second rotating ring 9 is arranged below the travelling belt 1, said ring revolving in synchronism with the first rotating ring 5. Light sources 10 are provided on ring 9 and these are spaced and arranged in a manner which corresponds with the spacing and positions of the photocells 7. A second cleaning brush 11 is provided to keep the light sources clean. When the two rings 5 and 9 rotate, the beam emanating from the light sources 10 is interrupted when any part of the sprayed material moves into the path of the beam. When light sources 10 and photo-electric cells 7 reach points outside the area of the sprayed material the beam from the light source 10 will reach the relative photo-electric cell which generates a pulse whereby the associated spray gun is shut off. Instead of with light sources 10, the second ring 9 may be fitted with mirrors which reflect a beam emanating from a light source fitted to the photo-electric cells in such manner that the beam will be directed to the photo-electric cell.

#### WHAT WE CLAIM IS:—

1. A method of controlling with the aid of photo-electric cells the spraying by means of spray guns of flat extended pieces of material, such as of pieces of leather, sheets of metal, or the like, conveyed in continuous motion on horizontal conveyor means, characterised in that the spray guns move around a circular path and are controlled by photo-electric cells which move along the same circular path.

2. Method according to Claim 1, characterised in that the photo-electric cells move at the same speed as the spray guns but precede them in the direction of rotation.

3. Apparatus for performing the method claimed in Claims 1 and 2, characterised in that the spray guns and the associated photo-electric cells are mounted on a rotating spider or ring.

4. Apparatus according to Claim 3, characterised in that the photo-electric cells are adjustable in relation to the spray guns in the direction of rotation of the rotating spider or ring.

5. Apparatus according to Claims 3 and 4, characterised in that there is associated with the rotating spider or ring which carries the spray guns and photo-electric cells a second rotating spider or ring which carries mirrors or light sources in such manner that the sprayed material travels between the two spiders or rings in spaced relationship thereto.

6. Apparatus according to Claim 5, characterised in that the two rotary rings revolve in synchronism.

**Fig. 1**

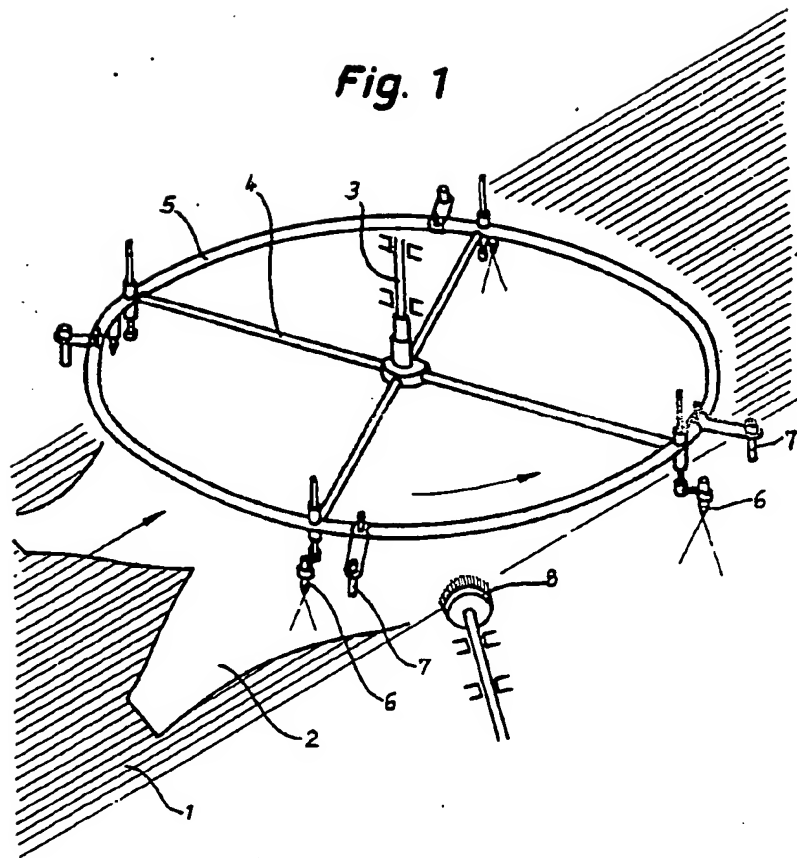
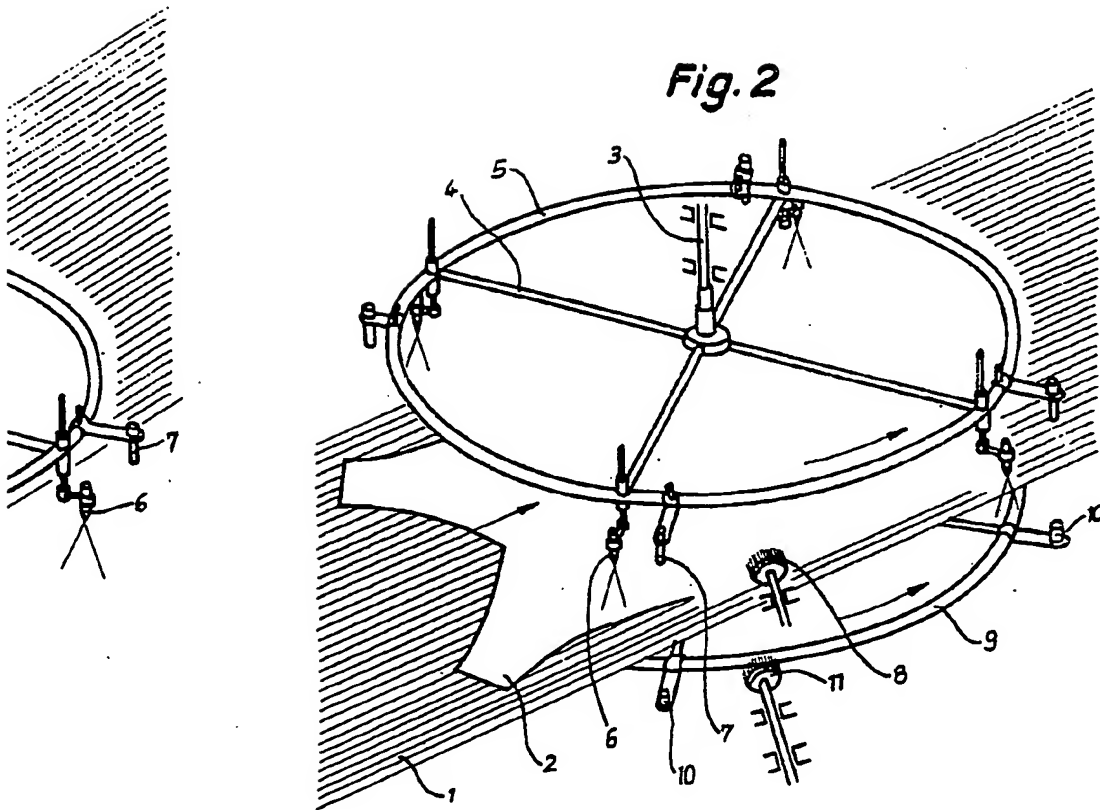


Fig. 2



835,670 COMPLETE SPECIFICATION  
 2 SHEETS This drawing is a reproduction of  
 the Original on a reduced scale.  
 SHEETS 1 & 2

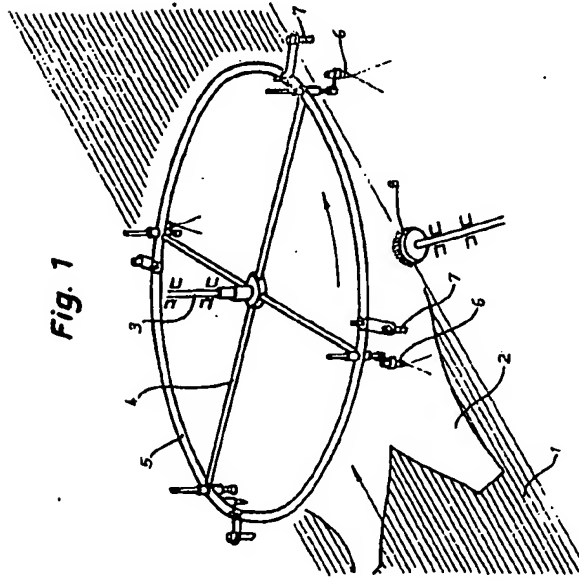


Fig. 2

